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nectors 103-105. The detachable IR emitting/receiving element 106 is composed of the IR light-emitting diode (LED) 205 and the photodiode 206 and is capable of being electrically connected to a desired one of the IR element connectors 103-105. Therefore, when receiving the transmitting signal, the LED 205 of the detachable IR emitting/receiving element 106 emits an IR ray according to the transmitting signal. On the other hand, when receiving an IR ray from another apparatus, the photodiode 206 converts the IR ray into an electric signal and then transfers it to the transmitter/receiver 201 through the IR element connector into which the detachable IR emitting/receiving element 106 is inserted.

As illustrated in FIG. 5, assuming that the portable electronic apparatus 10 makes an IR data communication with another portable electronic apparatus 11 having the IR emitting/receiving element 109 directed toward the portable electronic apparatus 10. Therefore, the user of the apparatus 10 attaches the detachable IR emitting/receiving element 106 to the IR element connector 103 which is directed toward the portable electronic apparatus 11, and then the IR communication is started.

As described above, the portable electronic apparatus 10 can easily provide IR communications with other apparatuses without the inconvenience of changing the direction of the apparatus 10. Further, it is preferable that each side of the apparatus housing is provided with the IR element connector.

What is claimed is:

1. A portable electronic apparatus having an infrared communication function, the apparatus comprising:

a housing containing electronic circuits including a circuit necessary for the infrared communication function;

a plurality of first connectors provided on outside surfaces of the housing, the first connectors being electrically connected to the circuit contained in the housing; and

a detachable infrared element for emitting and receiving infrared rays, the detachable infrared element including a second connector which is detachably connected to any selected one of the first connectors to provide electrical connection to the circuit contained in the housing and to provide infrared communication from the outside surface of the housing having the selected first connector, and thereby the apparatus is capable of infrared communication in different directions relative to the outside surface of the housing having first connectors.

2. The apparatus according to claim 1, wherein the first connectors are provided in side surfaces of the housing, respectively.

3. The apparatus according to claim 1, wherein the housing has a box-like shape.

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4. The apparatus according to claim 3, wherein the first connectors are provided in side surfaces of the housing, respectively.

5. The apparatus according to claim 1, wherein the detachable infrared element further comprises:

an infrared light-emitting device for emitting an infrared ray according to a transmitting signal received from the circuit; and

an infrared detector for detecting an infrared ray and converting the infrared ray into a received signal.

6. The apparatus according to claim 5, wherein the circuit necessary for the infrared communication function comprises:

a transmitter-receiver for transmitting the transmitting signal to the first connectors and receiving the received signal from the one selected from the first connectors;

a user interface for presenting information to a user and inputting instructions and data from the user; and

a controller for controlling the transmitter-receiver and the user interface so as to perform the infrared communication function.

7. The apparatus according to claim 1, wherein each of the first connectors is formed in a recess shape into which the second connector is detachably inserted.

8. The apparatus according to claim 7, wherein each of the first connectors has predetermined number of pins placed in the recess and the second connector has the predetermined number of pin holes into which the pins are inserted when the second connector is inserted into the one selected from the first connectors.

9. The apparatus according to claim 1, wherein each of the first connectors is a port for providing electrical connection to the second connector.

10. An infrared communication method between a portable electronic apparatus and an electronic apparatus which are both provided with an infrared communication capability, the method comprising the steps of:

preparing a plurality of infrared element connectors on different outside surfaces of the portable electronic apparatus;

inserting an infrared emitting-receiving element into an infrared element connector selected from the infrared element connectors to electrically connect the infrared emitting-receiving element with the portable electronic apparatus and to direct the infrared emitting-receiving element in a direction toward the electronic apparatus; and

performing infrared communication with the electronic apparatus through the infrared emitting-receiving element connected to the selected infrared element connector.

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